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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/592,971	09/15/2006	Heon Jin Choi	930086-2038	4062

7590 08/05/2009
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EXAMINER

CHANG, HANWAY

ART UNIT	PAPER NUMBER
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2881

MAIL DATE	DELIVERY MODE
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08/05/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/592,971	Applicant(s) CHOI ET AL.	
	Examiner Hanway Chang	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 June 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 06/03/2009 have been fully considered but they are not persuasive. Applicant argues that Niu et al. (US PGPub 2008/0073505, hereinafter Niu) does not qualify as prior art. Applicant has submitted that Niu claims priority to 09/17/2004. Examiner would like to note that Niu does qualify as prior art as the claimed foreign priority has not been perfected (certified English translation), therefore does not receive the priority date.

Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a certified English translation of the foreign application must be submitted in reply to this action. 37 CFR 41.154(b) and 41.202(e).

Failure to provide a certified translation may result in no benefit being accorded for the non-English application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 8-9, 12-13, 18-19, 21, 24, and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Niu et al. (US PGPub 2008/0073505, hereinafter Niu).

Regarding claims 1, Niu discloses forming a nanowire spot by growing a plurality of minute nanowires in the selected area of a conductive material capable of applying voltage (see paragraph [0051]); placing the specimen containing a substance to be analyzed in the nanowire spot and crystallizing by drying (see paragraph [0059]); and performing mass spectrometric analysis of the specimen containing a substance to be analyzed in a state where voltage is applied in the board, while simultaneously irradiating laser onto the nanowire spot, wherein the specimen is adsorbed to and crystallized in the nanowire under reduced pressure, to transfer energy to the specimen through the nanowire (see paragraphs [0049-0050]). It should be noted that the nanowires are shown in Fig. 2A as the thin non-silicon film layer (22) having a nano-structured surface (see paragraph [0050]). It should be further noted that each thin non-silicon film layer (22) is on a support substrate (10) as seen in Fig. 1 as being a plurality of wire-like structures. It should be further noted that mass spectrometry is inherently in a vacuum state (reduced pressure) unless stated otherwise.

Regarding claims 3, 12, and 21, Niu discloses the nanowire to be grown is alumina (Al_2O_3) (see paragraph [0051]).

Regarding claims 8, 18, and 27, the value of the mass over electric charge (m/z) of ions is inherently measured while performing mass spectrometric analysis of the specimen containing a substance.

Regarding claims 9 and 19, Fig. 1 of Niu discloses manufacturing nanowire suspension containing a plurality of minute nanowires (22) (see paragraph [0051]); forming a nanowire islet after drying the nanowire suspension coated on the selected area of a conductive material or a semiconductor board capable (10) of applying voltage (see paragraph [0049]); placing the specimen (12) containing a substance to be analyzed in the nanowire spot and crystallizing by drying (see paragraph [0059]); and performing mass spectrometric analysis of the specimen containing a substance to be analyzed in a state where voltage is applied in the board, while simultaneously irradiating laser onto the nanowire spot, wherein the specimen is adsorbed to and crystallized in the nanowire under reduced pressure, to transfer energy to the specimen through the nanowire (see paragraph [0049-0050]). It should be noted that the nanowires (22) are used to hold an active layer (24) in place, therefore the nanowire (22) are nanowire suspensions. It should be further noted that mass spectrometry is inherently in a vacuum state (reduced pressure) unless stated otherwise.

Regarding claims 13 and 24, Niu discloses the nanowire suspension is formed by spraying on the selected area of the semiconductor board (see paragraph [0051]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4-7, 10-11, 14-17, 20, 22-23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niu.

Regarding claims 2, 11, and 20, Niu discloses forming the nanowire except that the nanowire has a diameter of 500 nm or less and an aspect ratio of 10 or higher. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Niu by forming the nanowires with certain dimensions, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 4, 14, and 25, Niu does not explicitly disclose that the nanowire spot is formed so that it is equal to or smaller than the area for laser irradiation. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to modify Niu by forming the nanowire spot such that it is equal to or smaller than the area for laser irradiation for the purpose of controlling the amount of analytic molecules.

Regarding claims 5, 15, and 22, Niu does not explicitly disclose the specimen comprises a salt and the material to be analyzed, wherein the concentration of the salt is greater than 10 mM. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to choose a specimen comprising a salt with a concentration of greater than 10 mM, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 6, 16, and 23, Niu does not explicitly disclose the material to be analyzed in the specimen contains less than 1 femto mole. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to adjust the concentration of the specimen such that the material to be analyzed in the specimen contains less than 1 femto mole, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claims 7, 17, and 26, Niu does not explicitly disclose the energy of the laser. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Niu by adjusting the energy of the laser such that the energy is greater than the band gap of the nanowires grown in the semiconductor board according to the kind of nanowires to be selected., since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanway Chang whose telephone number is (571)270-5766. The examiner can normally be reached on Monday to Friday 7:30 AM till 4 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Hanway Chang

July 31, 2009

/H. C./

Examiner, Art Unit 2881

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881